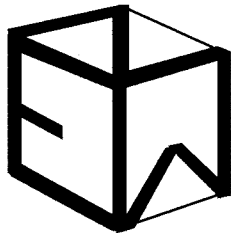


Outline of Tasks and Costs for Obtaining a Beneficial Use Permit

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**Outline of Tasks and Costs
for
Obtaining a Beneficial Use Permit**

Existing Program

1. Consulting Services

- a. Planning, investigation and testing
 - i. Meeting with clients and planning to address client water management goals.
 - ii. Evaluate hydrogeologic setting (reviewing geology maps, existing ground-water information etc.).
 - iii. Examining other potential factors including (but not necessarily limited to):
 - (1) Nearby streams for potential hydraulic connection
 - (2) Nearby users of ground water
 - (3) Siting the well locations (the minimum number of wells is typically two wells as one will be needed as an observation well).
 - iv. Field services
 - (1) Logging wells/well construction over-sight
 - (2) Surveying wells for location and other relevant features
 - (3) Conducting pumping test(s) as appropriate. Tests must be conducted in accordance with DNRC rules. Most tests now require the following:
 - (a) Forty-eight (48) hours of data collection preceding a pumping test.
 - (b) Conduct pumping step-test (optional but advisable).
 - (c) Conduct 72 hour pumping test in well.
 - (d) Restart test if necessary (note that generator failures, instrumentation failures, etc., often occur).
 - (e) Typically measure water level responses in constructed wells and in other nearby wells as appropriate. If a nearby stream is present, consideration must be given to instrument that stream too. Water levels are measured using pressure transducer instrumentation. Pumping flows must be measured by flow meters.
- b. If public water supply wells are involved, it will be necessary to complete a preliminary design report on well construction and a PWS-6 or source water protection plan for Montana Department of Environmental Quality (DEQ). Drilling cannot commence until DEQ approves the wells for drilling

and testing.

- c. Data synthesis and evaluation.
 - d. Completion of Hydrology Report
 - e. Completion of Beneficial Use Permit application. Must demonstrate that water is both physically and legally available. Must address potential for adverse impacts to nearby users and potential impacts to nearby streams. This requires obtaining data from sources, analytical simulations and potentially modeling simulations.
 - f. Typical consulting fee costs range from about \$ 20,000 for a small project to well over \$ 50,000 for a large multi-well, complex project. For a multi-year project, fees can go higher. See Table 1.
 - g. If the project is contested, costs will increase in accordance with the nature of the objections.
2. Installation of wells and pumping test assistance by driller. These costs will vary dramatically based upon the geologic conditions.
- a. Generally, a minimum of two wells is necessary. One of these wells may be a lower cost well purely installed for monitoring purposes. If large public water supply wells or irrigation wells are involved, construction costs generally range from as low as \$ 15,000 to nearly \$ 200,000 each. The lower costs generally relate to wells placed in shallower strata such as alluvium. The higher costs relate to deeper wells placed in complex strata, or for very large/high capacity water supply wells. The costs at this stage are for the drilling and testing. It does not include costs that will accrue later for final design, pump installation and hook-up to power and pumping house infrastructure, etc..
 - b. Drillers will also be employed to conduct the necessary pumping tests to determine the water-bearing capacity of the strata. Equipment necessary will include:
 - i. Generator (large)
 - ii. Pump(s)
 - iii. Drillers will provide labor as necessary to assist in the following tests:

- (1) Step test
 - (2) 72-hour pumping test
 - (3) 72-hour recovery (note the pump remains in the well until the recovery data are collected).
- c. Costs for the pumping test equipment rental and services typically ranges from \$ 7,500 to \$ 15,000 (72 hour pumping test). Again, this cost depends upon the specific project.
- d. Total overall driller typical cost range from \$ 22,500 (simple project) to \$ 215,000 (more complex project).
3. At this stage, there is no guarantee that the beneficial use permit will be granted as this must be resolved through the permitting and potential contested hearing process.
4. For a project that is not contested, the permitting time frame will take approximately a year. Much longer delays, up to several years occur, if the project is contested. Most projects in closed basins are contested.
5. The costs associated with contested hearings include the following:
 - a. Legal fees
 - b. Additional consulting fees
 - c. Time value of an investment made with no return.
6. Again, there is no guarantee that the beneficial use permit will be granted. Even if the permit is granted, there may be appeals, lawsuits, etc. that occur.

Augmentation Program - Projected Costs

7. Augmentation Program Requirements

- a. The costs for consulting services will increase for completing an augmentation program. The magnitude of this increase will be generally proportional to the following:
 - i. Nature of the required augmentation program. There are two fundamental options available for augmentation and they are:
 - (1) Leave surface water flows in stream (most cost effective and practical).
 - (2) Conduct a recharge augmentation program.
 - ii. Leaving flow in the stream is more cost effective. However, communications with FWP legal staff indicate that this is not always a preferred option.
 - iii. Augmenting stream flow would involve using an existing water right to supply a volume of flow that would offset the amount of water that is consumptively used. The following are some limitations or issues that must be addressed:
 - (a) It is likely that the historic period of use was associated with irrigation (typically only have historic use during the irrigation seasons, say from May 1 through September 30).
 - (b) It must be a senior water right.
 - (c) Wintertime depletions, if they are deemed a concern, cannot be addressed by leaving water in the stream.
 - (d) The applicant may not have an existing surface water right to use for surface water augmentation purposes. If not, the project may need to be abandoned or an existing water right will need to be acquired. That right must be able to address the affected reach.
 - iv. **Augmenting with ground water is far more complex and will be far more costly than augmenting with surface water.**
 - (1) Potential augmentation methods include recharge from ponds, surface water spreading, infiltration recharge

galleries (e.g., Utility Solutions), or injection wells.

- (2) All these potential methods have serious technical limitations depending upon the given geologic setting.
- (3) It will be necessary to conduct additional field investigations to determine if it is technically feasible to implement an augmentation program using surface recharge methods.
- (4) Relatively thick, low permeability geologic strata will often render the surface recharge methods as infeasible. Some geologic strata may not be permeable enough to receive recharge water at a rate to meet the project requirements. In this situation, the project would not be implementable.
- (5) If augmentation is deemed to be technically feasible, it will be necessary to conduct additional analytical evaluations, or numerical model simulations to satisfy the agency that the process will meet their requirements, and to meet potential objector concerns.
- (6) Reinjection of water via wells suffers both serious technical limitations and regulatory limitations. Biofouling often arises in wells, etc.. It will be necessary to obtain an Underground Injection Permit from the U.S. Environmental Protection Agency. This process is arduous and takes several years. This is considered an infeasible option.
- (7) There are potential infrastructure constraints including:
 - (a) Presence of irrigation infrastructure (e.g., ditches and piping) is greatly helpful. Otherwise costs will escalate accordingly to construct such infrastructure.
 - (b) It may be necessary to construct new ditches or place piping to move the water to location necessary. This will potentially require obtaining property easements, road easements, etc., for placing such infrastructure.
- (8) It may be necessary to use another property owner's land to accomplish the project objectives. Hence, it may be necessary to acquire land, or obtain easements, accordingly.
- (9) The applicant may not have the surface water right to be

used for augmentation. It would be necessary to acquire a water right, if they are available, and if that right meets the constraint requirements to address the "affected reach."

- (10) It will be necessary to demonstrate historic consumptive use.
- v. The added consulting fees for the above will vary depending upon the complexity. It is not unreasonable to assume that those additional costs at the low end will increase by \$ 7,500 for a simple project whereby it is acceptable to leave water in the stream. If augmentation via recharge basins is required, it is not unreasonable to assume costs at or exceeding \$ 150,000. This assumes a relatively complex project that involves engineering design, ground-water modeling, surveying, and construction oversight.
 - b. Augmentation will often be technically infeasible or non-implementable simply because augmentation surface water will not be available, particularly in areas where surface water irrigation had not been practiced historically. For instance, in the Big Sky area of Montana, historic irrigation has not been practiced at any substantive scale in the Gallatin River drainage. Hence, there is no meaningful option for augmenting the "affected reach" in that area. There are likely to be economic hardships for other geographic areas and economic sectors as well, including agriculture, development, real estate, etc.
 - c. If the project is implementable, the construction costs necessary will vary in accordance with geologic conditions, physical location, and the amount of infrastructure that must be constructed. It is not unreasonable to assume that the added construction costs would range from a minimum of \$ 50,000 to several hundred thousand dollars. Costs increases will be most dramatic if it necessary to pump/pipe the water to locations that do not currently have irrigation ditches or canals nearby.
 - d. There will be long-term operation and maintenance (O&M) costs for projects that use ground-water augmentation. The O&M costs are projected to range from a minimum of a few thousand dollars per year to tens of thousands of dollars per year, depending upon the scale of the project. These O&M costs will likely include energy costs for pumps to move water to the necessary location, equipment and infrastructure maintenance, metering costs, monitoring, etc..

8. Table 2 summarizes the anticipated costs. Please note that an upper limit in costs for a program requiring augmentation cannot be defined without knowing site specific conditions. Total costs near and even exceeding \$ 1,000,000 would not be unreasonable to assume for a large, complex project.
9. In summary, the economic feasibility of water supply projects would be affected significantly if augmentation is involved.

Table 1

**Representative Cost Summary - Non-Contested
No Augmentation**

Cost to Complete Application - Correct and Complete

Small Subdivision or Small Irrigation Well - Geology Not Complex

Consulting Fees \$20,000

Driller Fees \$22,500

Permit Application \$600

====> \$43,100

Large Subdivision and/or Deep Wells in Complex Geology

Consulting Fees \$50,000

Driller Fees \$200,000

Permit Application \$600

====> \$250,600

Representative Cost Range from **\$43,100** to **\$250,600**
 Round off to **\$43,000** to **\$250,000**

Does not include legal assistance fees.

Table 2

Representative Cost Summary
Augmentation - Non-contested Application *

Example 1: Small Subdivision or Small Irrigation Well - Geology Not Complex
Water left in stream using existing beneficial use permit.

Consulting Fees	\$27,500
Driller Fees	\$22,500
Permit Application	\$600

Minimum ==> \$50,600

Example 2: Large Subdivision, Public Utility and/or Deep Wells in Complex Geology
Water must be placed in a target aquifer via augmentation (if technically feasible)

Consulting, Engineering Design, Construction Oversight	\$150,000
Capital Equipment Costs	**
Construction Costs ***	**
Present Value - Operation and Maintenance Costs (O&M)	**
Driller Fees	\$200,000
Permit Application	\$600

==> \$350,600

Representative Cost Range **from** **\$50,600** **to** **\$350,600**
 Round off to **\$51,000** **to** **\$350,000**

(not including capital equipment, construction and O&M costs for recharge augmentation system)

* Consulting and legal fees will increase accordingly if a contested hearing evolves. Contested hearings are common-place in basin closure areas.

** Capital, construction and O&M costs are indeterminate and would be based upon site conditions. Capital needed would include equipment such as:

- 1 Pumps
- 2 Pipeline(s)
- 3 Infiltration galleries
- 4 Metering instrumentation
- 5 Etc.